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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/662,325	09/14/2000	Rami Evron	24379	1469

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BROWDY AND NEIMARK
624 NINTH STREET, NW
WASHINGTON, DC 20001

EXAMINER

KIM, CHONG R

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 01/16/2004

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/662,325

Applicant(s)

EVRON ET AL.

Examiner

Charles Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,4,5,7,8,10-12,14,15,18,19 and 24-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,4,5,7,8,10-12,14,15,18,19 and 24-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment and Arguments

1. Applicant's amendment filed on October 29, 2003 has been entered and made of record.
2. Applicant's substitute specification filed on October 29, 2003 has been approved, entered, and made of record.
3. In view of applicant's amendment, the objection to claim 4 is withdrawn.
4. In view of applicant's amendment canceling claim 1, the 112 first paragraph rejection is withdrawn.
5. Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicants argue (pages 9-10) that their claimed invention (claims 24, 29, 31) differs from the prior art because "Chen is directed to a method for generating a three-dimensional reconstruction of an arterial tree", while the applicant's invention is directed to "reconstructing only the artery, without reconstructing the entire tree". The Examiner responds by pointing out that the claim language does not indicate reconstructing only the artery, without reconstructing the entire tree. The closest language to this feature in the claims appears to be in lines 7-9 of claim 24, which recites "generating a three dimensional reconstruction of the artery of interest from at least one of the displayed angiographic images". Therefore, the claim language does not indicate that the reconstruction is limited to only the artery of interest. In this case, Chen discloses generating a three dimensional reconstruction of an artery of interest (major vessel) (col. 6, lines 5-33 and col. 17, lines 18-28). As noted in the previous office action (pages 4-5), a

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three-dimensional reconstruction of the artery of interest is inherent in Chen's three-dimensional reconstruction of the arterial tree, since the three-dimensional reconstruction of the arterial tree includes the three-dimensional reconstruction of the artery of interest.

Claim Objections

The following quotation of 37 CFR § 1.75(d)(1) is the basis of objection:

(d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (See § 1.58(a)).

6. Claims 8 and 15 are objected to under 37 CFR § 1.75 (d)(1) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery. Referring to claim 8, the phrase "the three-dimensional display of the arterial tree" in lines 3-4 lacks antecedent basis. It appears that the applicant intended the phrase to read "a three-dimensional display of the arterial tree". A similar objection is applicable to claim 15. Appropriate corrections are required.

7. Claim 28 is objected to because of typographical errors. There appears to be a typographical error in the phrase "The system according to claim 28" in line 1. Note that a claim cannot be dependent on itself. It appears that the applicant intended the phrase to read "The system according to claim 24". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 2, 5, 7, 8, 10, 12, 14, 15, 18, 24, 26-31, 34-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al., U.S. Patent No. 6,047,080 ("Chen").

Referring to claim 24, Chen discloses a system for imaging an artery contained in an arterial tree, the system comprising:

- a. a processor adapted for coupling to a display device for displaying on the display device at least two angiographic images of the arterial tree from different perspectives (col. 6, lines 16-22 and figure 3)
- b. the processor being responsive to an artery of interest (main vessel) in the displayed angiographic images for generating a three dimensional reconstruction of the artery of interest from at least one of the displayed angiographic images (col. 6, lines 5-33 and col. 17, lines 18-28. The Examiner notes that a three-dimensional reconstruction of the artery of interest is inherent in Chen's three-dimensional reconstruction of the arterial tree, since the three-dimensional reconstruction of the arterial tree includes the three-dimensional reconstruction of the artery of interest).

Referring to claim 2, Chen discloses that the microprocessor is further configured to display on the display device the reconstruction of the artery (col. 17, lines 34-37).

Referring to claim 5, Chen discloses that the microprocessor is further configured to manipulate an image on the display (col. 18, lines 31-38).

Referring to claim 7, Chen further discloses that the microprocessor is configured to display on the display a view of the three-dimensional reconstruction of the artery from a selected perspective, such as a cross sectional perspective [col. 18, lines 31-38. The Examiner notes that displaying a view of the three-dimensional reconstruction of the arterial tree will inherently display a view of the three-dimensional reconstruction of the artery, since the artery is included in the arterial tree, as noted above. Chen explains that the three-dimensional reconstruction of the artery is displayed from a selected perspective (view), wherein the reconstructed artery is represented by cross-sectional contours (col. 17, lines 20-30 and col. 18, lines 31-38).

Referring to claim 8, Chen further discloses that the three-dimensional reconstruction of the artery is displayed on the display device embedded in a three-dimensional display of the arterial tree (col. 18, lines 31-38. The Examiner notes that displaying the three-dimensional reconstruction of the arterial tree will inherently display the three-dimensional reconstruction of the artery embedded in the three-dimensional display of the arterial tree, since the artery is included in the arterial tree).

Referring to claim 26, Chen further discloses that the processor is adapted to be coupled to a manual selection device for selecting the artery of interest manually (col. 6, lines 16-22).

Referring to claim 27, Chen further discloses that the processor is responsive to an additional perspective being selected for updating the reconstruction of the artery of interest for display by the display device (col. 18, lines 31-36).

Referring to claim 28, Chen further discloses that the processor is responsive to one or more manual operator commands for image processing the reconstructed artery for display on the display device (col. 18, lines 31-36).

Referring to claim 29, Chen discloses a system for imaging an artery contained in an arterial tree, the system comprising:

- a. a display device for displaying at least two angiographic images of the arterial tree from different perspectives (col. 6, lines 16-22 and figure 3)
- b. a selection device for selecting an artery of interest (major vessel) in the displayed angiographic images (col. 6, lines 16-22 and figure 3).
- c. a processor coupled to the display device and to the selection device for generating a three dimensional reconstruction of the artery of interest from at least one of the displayed angiographic images (col. 6, lines 5-33 and col. 17, lines 18-28. The Examiner notes that a three-dimensional reconstruction of the artery of interest is inherent in Chen's three-dimensional reconstruction of the arterial tree, since the three-dimensional reconstruction of the arterial tree includes the three-dimensional reconstruction of the artery of interest).

Referring to claim 30, Chen further discloses that the selection device is a manual operator control (col. 6, lines 19-21).

Referring to claim 31, see the rejection of at least claim 29 above. Chen further discloses displaying the three dimensional reconstruction of the artery of interest (col. 18, lines 31-36).

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Referring to claims 34 and 35, see the rejection of at least claim 31 above.

Referring to claim 10, see the rejection of at least claim 2 above.

Referring to claim 12, see the rejection of at least claim 5 above.

Referring to claim 14, see the rejection of at least claim 7 above.

Referring to claim 15, see the rejection of at least claim 8 above.

Referring to claim 18, Chen further discloses that the arterial tree is a coronary arterial tree (col. 18, lines 31-32).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4, 11, 19, 25, 32, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Chen et al., U.S. Patent No. 6,047,080 ("Chen") and the article entitled "A Viewpoint Determination System for Stenosis Diagnosis and Quantification in Coronary Angiographic Image Acquisition" by Sato et al. ("Sato").

Referring to claim 4, Chen does not explicitly state that the microprocessor is configured to make metrological measurements on the reconstruction of the artery. However, making meterological measurements on a reconstruction of an artery was exceedingly well known in the

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art. For example, Sato teaches the step of making meteorological measurements on a three-dimensional reconstruction of an artery (page 122).

Chen and Sato are both concerned with analyzing three-dimensional reconstructions of an artery based on angiographic images. Chen explains that his system is utilized for clinical use (Chen, col. 18, lines 31-36). Sato provides a computer assisted diagnosis system that provides reliable diagnosis and quantification of stenosis in coronary angiography (page 121). Therefore, it would have been obvious to modify the processor of Chen so that it is configured to make meteorological measurements on the reconstruction of the artery, as taught by Sato, in order to contribute to the advancement in the medical/clinical field by enhancing the diagnosis of coronary artery diseases.

Referring to claim 25, Chen does not explicitly disclose that the artery of interest (major vessel) is a stenotic artery. However, the Examiner notes that an artery of interest characterized by a stenotic artery was exceedingly well known in the art. For example, Sato discloses an artery of interest that is a stenotic artery (pages 122 and 125). Sato further discloses that the meteorological measurements include a severity and length of stenosis of the artery (page 122).

Chen and Sato are both concerned with analyzing three-dimensional reconstructions of an artery based on angiographic images. Chen explains that his system is utilized for clinical use (Chen, col. 18, lines 31-36). Sato provides a computer assisted diagnosis system that provides reliable diagnosis and quantification of stenosis in coronary angiography (page 121). Therefore, it would have been obvious to combine the teachings of Chen and Sato, in order to contribute to the advancement in the medical/clinical field by enhancing the diagnosis of coronary artery diseases.

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Referring to claim 11, see the rejection of at least claim 4 above.

Referring to claims 32 and 33, see the rejection of at least claim 25 above.

Referring to claim 19, Sato further discloses that the stenotic artery has a lumen, the lumen has a cross-section of maximal narrowing (page 126, middle of right column), the cross-section of maximal narrowing has a fraction occluded by plaque, and determining the severity of the stenosis includes determining the fraction of the cross-section of maximal narrowing occluded by plaque (page 122, left column).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

ck
January 7, 2004


AMELIA M. AU
SUPERVISORY PATENT EXAMINER
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